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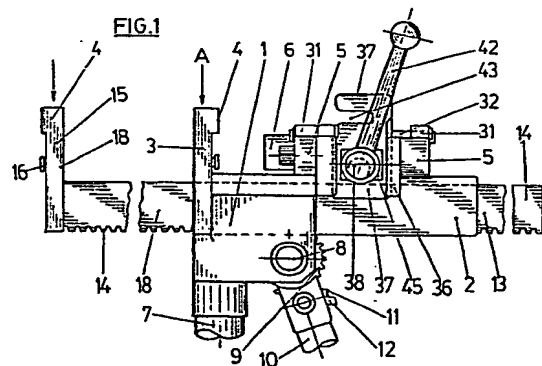
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54 A machine for connecting up casings by means of axial thrust.

57 The invention consists of a new machine for connecting up casings by means of axial thrust, and its application are in processes in which it is necessary to join parts, by means of axial thrusts, with parallel displacements and so it has very many different applications, for example, to engage the ends of coupling hosepipes or coupling boxes.



EP 0 341 180 A1

## Description

### History of the Invention

When this type of procedure is attempted, there are static machines available, which are very costly and complicated. The object of the present invention on the contrary, is a light, easy to operate machine, which can be used on sites and in places that are hard to get at. The procedures must therefore be simple and effective and there must be no possibility of the parts that comprise the whole, becoming detached.

In the case of machines of this light type, no efficient machines are known.

An explanation of the machine is given below, referring to the arrangement of the parts it is comprised of.

#### MAIN BODY (1).

The holder -7- is an integral part.

- It has a crosswise partition -3- in the shape of a fork where the part -26- is lodged.

- It has the spin axis -8- around which the second holder -10- rotates and also serves to rotate the pinion -9- that rams the toothed rack -14-.

- It is prolonged in a casing -2- in a "U" section that forms the housing -29- inside, where the piece -13- can slide, which is cut in the shape of a toothed rack -14-.

- On this casing -2- and therefore locked into the whole of the general casing -1- there is a semi-cylindrical seating -5- that has ears -31- where an axle -32- is fixed to permit the other half of the clasp -6- to be lowered.

- At the side of this casing -5- it has guides -36- which permit the piece -37- to be slipped by thrust of the cam -39- which is linked to the lever -42-.

- When the piece -37- is shifted, the peg -35- which is linked to the part -6- is dragged along and a stable grip is made.

#### MOBILE BODY (13).

- Which has the toothed rack -14- on one of the sides.

- Which has the plate -15- at one end.

- In this said plate -15-, in the space -20-, the piece -21- is lodged which will be held by the stubs -4- and the tension of the spring -17-.

The Machine works as follows:

Bringing together and separating the two lever arms -7- and -10- according to the position of the latch -12- which turns on the point -11-, the pinion -9- is made to turn in one direction or another. By this turning of the pinion -9-, the piece -13- is dragged along, since the pinion is locked into the toothed rack -14-.

This movement determines whether the sheets -15- and -3- are brought together or separated and consequently determines coupling of the bodies by simple axial pressure.

For the frontal support of one of the pieces to be connected, the part -21- has been provided, which is quickly lodged and held in the housing -20- where it is gripped.

The other part to be connected is held by the holders -5- and -6- which are brought together by simply turning on the axis -32- after the peg -35- has been placed in the groove -43- by turning of the lever -42- as per F gripping is made quickly and effectively.

This part held thus, also has an intermediate support point in the piece -26- which can be placed in the forked part of the sheet -3- where it is held firmly thanks to the stubs -4- and the spring -17- which it has on one of its sides.

With regard to the state of the above technique, the machine proposed by the invention offers the following advantages:

Quick gripping by means of the type of holder -5- and -6- and the operating lever -42-, of one of the pieces it is desired to connect.

Quick gripping of the parts -21- in the fork -15- and of the part -26- in the fork -3-.

But besides quick gripping, the gripping is stable and permits the machines to be used in all sorts of positions, with no danger of the auxiliary parts becoming detached.

Besides quick gripping, it must be pointed out that the separation of the pieces held, for substitution, is also done easily and quickly since this is the opposite operation.

A more complete idea of the invention is provided by the following description in which reference is made to the enclosed sheets of drawings which represent the whole and preferred details of the invention.

In the drawings:

Figure 1 corresponds to an elevational view of the whole of the machine; it is the position it adopts at one moment such as for receiving the bodies that have to be joined together axially.

In this figure the fundamental body -1- is shown clearly which in the lower part has one of the driving levers -7- interlocked and in turn has the spin axis -8- where the second holder -10- is articulated.

This fundamental body -1- is prolonged upwards in one direction in a sheet -3- with the shape of a fork, where the supplementary parts -26- will be held if advisable, which will serve as a support for one of the pieces that have to be joined axially.

On the other side it is prolonged in a body -2- that comprises a guiding housing -29- where the piece -13- will be slipped cut in the toothed rack -14-.

This same body has a semicylindrical housing -30- interlocked in the body -5-, on which one of the pieces it is desired to connect is placed. Having a fixing device that acts by means of a lever -42- which by means of a cam determines the descent and gripping of the part -6- which serves as a clasp.

Besides representing the main body, in this figure the part -13- can be seen which can be shifted as soon as the arm -10- is made to rotate so that the pinion -8- acts on the toothed rack -14-.

This part -13- likewise ends in a sheet -15- in the form of a fork, between the branches of which the supplementary piece -21- will be lodged.

The supplementary piece -21- is lodged in the fork -15- following the placement movement -B-. Then a turn is made in same as per -C- and it is clamped in a stable position. In the same way, the supplementary part -26- will be lodged in the fork -3- introducing it between its arms as per -A- to achieve the same hold including spring, by means of rotation, as holding of the piece -21- already mentioned is made.

Figure 2 serves to represent the whole place -21- which is the one that will be lodged in the fork -15-. The outline of the place -24- of this piece will be suitable for one of the pieces it is wished to join axially by means of the present machine.

Figure 3 serves to represent the whole of piece -26- which is the one that will be lodged in the fork -3-. The outline of the housing -28- as well as its size will depend on one of the pieces it is desired to join axially by means of the present machine.

Both piece -21- which will be held in the fork -15- as well as piece -26- which will be held in the piece in the form of a fork -3-, will be introduced by simple thrust and will be rotated as per -C- to be positioned in their corresponding housings in a stable manner.

Figure 4 is a view of the forked part of the end of the part -13-, which is where the part -21- will be lodged. It can be seen that it has a spring -17- which will make the fixing stable because of its tension.

Figure 5 is a view in which is represented the way in which the part -21- is left stable.

In the same way in which the part -21- is held, the piece -26- is held in the fork -3- that also has the spring -17- and the limiting stops -4-.

Figure 6 is a flat view. The quick holding device shows the two parts of the semicylindrical housing -30- the lowered part -6- with the other semicylindrical one -34-.

Lowering is made around the axis -32- and the elevational position is represented in figure 8.

Figure 7 is a flat view when the part -6- is already lowered down onto the part -5- and ready to hold a possible piece -44-.

This elevational arrangement is seen in figure 9.

Figure 8 is a cross section of a section of the machine showing the quick holding arrangement it has, opened out.

It shows the way that any piece -44- can be placed, simply placed in direction -D- on the cavity that the piece -5- forms, so that, the piece -6- will happen to cling to the piece -44-, making it then rotate on the axes -32- as per -E-.

Figure 9 is a similar view to the previous one, when the piece -6- has been rotated, lowered on -5-.

Figure 10 is an elevational view, after the piece -6- has slid on the axis -32- until the peg -35- linked to the piece -6- has been introduced in the groove -43- of the piece -37-.

It is after taking up this position, when the lever -42- is moved as per -F-, when by the action of the cam -39- lodged in the window -45- of the piece -37- it makes this descent, until the necessary holding pressure of the piece -6- against the piece -44- that it is wished to hold is substantiated.

Figure 11 is a section drawing that shows the way in which the piece -37- has descended by the action of the cam -39-.

Reference is now made to the different signs that have been used in the enclosed drawings, and the relationship that exists between one item and the other is also pointed out, both with regard to working and to assembly.

1. Basic body since all the items and devices that make up the machine are arranged on it.

2. Prolongation of the body -1- in the form of a "U" section guide in whose housing -29- the piece -13- is slid.

3. Robust integral sheet of the body -1- which is placed perpendicularly.

This sheet is permanently opposite to the other sheet -15-.

On this sheet the item -26- represented in figure 3 is placed and it is placed by moving as per -A- and then the piece is rotated so that it is held firmly by the lateral lugs -4- and the spring -17- that it has on one of its sides.

4. Lugs that both the sheet -3- and the sheet -15- have, which serve to stabilize the pieces that are fitted into the forked part of same.

5. Support body of the piece (one of them) that it is wished to connect.

It is comprised of a semicylindrical shape as can be seen in figure 8.

This body established unity with the basic body -1-.

6. Body that completes the holder with the body -5-. It has the same shape and can move freely on the axis -32- rotating as per -E- as seen in figure 8.

7. One of the driving holders is linked to the body -1-.

8. On the body -1- there is an axis on which the pinion -9- rotates and the mobile holder -10- can also oscillate.

9. Pinion that is locked into the toothed rack -14-.

10. Mobile driving holder, that can rotate around the axis -8- has the latch built in which can be positioned according to the rotation it is desired to give to the pinion -9-.

11. Latch -12- spin axis.

12. Latch that pushes the pinion -9- in one direction or another and which is positioned by simple pressure.

13. Piece that is shifted along the guide -29- of the body -2-.

14. Toothed part in the form of a rack of the item -13-.

15. Robust sheet perpendicular to the body -13- It has the shape of a fork which can be seen in figure 4. A sheet that is opposite to the sheet -3- joined to the body -1-.

16. Fixing stubs of one of the ends of the spring -17-.

17. Spring that has one end held in the stub -16-. The other end held in the groove -18-. The purpose of this spring, both in the case of the sheet -15- as well as in the case of the sheet -3- is to fix the pieces -21- and -26- respectively, elastically.

18. Groove that holds the other end of the spring -17-.

19. Place where the piece -21- is fitted in after moving as per -B- and making the rotation as per -C-, so that the stub -4- can prevent separation.

20. Housing that the piece -21- has to occupy.

21. Piece that has the fluted part -25- to fit into the branches of the fork -15-. A part that serve as a support and holds one of the pieces it is wished to connect by confronting them and pushing them.

22. Flat part that piece -21- has so that after rotating as per -C- on the spring -17- this piece is supported in a stable position, preventing it becoming detached.

23. Flat part of the piece -21- that is left upwards, as seen in figure 5.

24. A part of a variable shape and also of a variable size, since it depends on the shape and size of one of the pieces that it is desired to join by axial pressure.

25. Peripheral grooves of the part -21- that serve to slot into the branches of the fork -15- when this is lodged in the place -20-.

26. Intermediate support piece, which will be lodged in the forked part of the sheet -3-. It will be placed following the -A- movement followed by rotation as per -C- and will be stabilized in the housing thanks to the stubs -4- that the sheet -3- has and the spring -17- that the sheet -3- also has on one of its sides.

27. Peripheral grooves that the piece -26- has to lodge into the branches of the fork -3-.

28. Housing that serves as support for the piece that will be held with the holder -5- and -6-.

29. Guiding groove that is set up inside the body -2-. The piece -13- is shifted through this groove.

30. Semicylindrical housing that the piece -5- comprises and in this housing the piece -44- which has to be joined, is placed.

31. Ears linked to the body -5- to hold the axis -32-.

32. Axis linked to the ears -31- and thanks to the ear -33- the piece -6- can be lowered on to it, and can also shift sidewise.

33. Ear linked to the body -6-.

34. Semicylindrical housing of the part -6- so that with the piece -5- the cavity can be formed that has to be occupied which has to be held -44-.

35. Peg joined to the body -6- which when the aforesaid piece is lowered in the manner represented in figure 8 following the direction -E- after having placed the piece -44- following the direction -D-, this peg is opposite to the groove -43- so that immediately afterwards by lateral displacement of the piece -6- the whole of the aforesaid peg will be fixed into the groove -43- in the manner seen in figure 10.

36. Guides linked to the body -1- which permit shifting of the piece -37-.

37. Piece that is slipped along the guides 36. On one part it has the groove -43- where the peg -35- will have been housed.

On the other side it has the window -45- where the cam -39- is lodged in such a way that by rotating the said cam by means of the lever that -42- is linked with (rotation as per -F-) descent of the piece -37- as per -G- is determined. Achieving gripping of the holder set up by means of the pieces -5- and -6-.

38. Piece of the lever -42- that is linked to the cam -39- on the inside.

39. Cam that is linked to the lever -42- and which is lodged in the window -45- so that by rotating it causes the movement to shift the piece -37- on the lateral guides -36-.

40. Holding of the lever -42- thanks to the groove that this part has inside and that permits rotation but prevents separation thanks to the screw -41-.

41. Holding of the whole lever -42- permitting it to rotate.

42. Lever to hold the holder -5- and -6- firmly.

43. Groove of the piece -37- in which place the peg -35- is lodged.

44. By means of example, a possible piece that it is wished to fix by means of the holder.

45. Window that the piece -37- has and that is occupied by the cam -39- in the manner seen in figure -10-.

In this way, rotation of the cam -39- causes the piece -37- to shift, sliding along its side guides -36-.

## Claims

1. Machine to connect casings together by means of axial thrust, of the type that is activated by two holders that move simultaneously coming together and going apart using one hand for each holder, which is basically characteristic because it comprises a basis body -1- on which all of the devices are arranged and because of this it has a body-guide -2- fitted and through the inside -29- with alternative rectilinear movement the piece -13- slides, which in one of the sides has the toothed rack -14-. On this body-guide there is a quick holding clamp, which is comprised of two pieces, one of them -5- permanently joined and forming a whole with the basic body -1- and the other -6- swivels on an axis, in such a way that fixing is made by means of a lever -42- that is linked to a cam -39-, linked to this basic body -1- is one of the driving holders -7- and the other holder -10- is freely swiveling around the axis -8- and finally this main body has an extension of a robust crosswise sheet -3- where a piece -26- is lodged and stabilized in its forked part, which serves as a support for one of the pieces that have to be connected by means of this machine.

2. Machine to connect casings together by means of axial thrust, as per claim 1 which is characteristic because the piece -13- that shifts alternatively, has a robust sheet -15- in the form of a fork perpendicularly at one end, in such a

way that in its housing -20- the piece -21- can be adapted, which is fluted outside as per -25- to fit in this manner, but the end -24- will be determined in shape and size by the design of one of the pieces that it is wished to connect by means of this machine.

3. Machine to connect casings together by means of axial thrust, as per claims 1 and 2 which is characteristic because the fork -15- that is set up at the end of the piece -13- has each of two thicknesses -4- on the outside in order to stabilize the piece -21- that has been lodged in the place -20- of same preventing any shifting.

4. Machine to connect casings together by means of axial thrust, as per claims 1, 2 and 3, which is characteristic because the fork -15- that is at the end of the piece -13- has a spring -17- on the outside with one end held by means of the peg -16- and the other lodged in the groove -18- of the side of the wall of the fork -15- in order to fix it elastically to the piece -21- that is supported on its flat part -22-.

5. Machine to connect casings together by means of axial thrust, as per claims 1 to 4, which is characteristic because the piece -13- that is shifted alternatively, has a toothed area -14- all along its length, in the manner of a rack, which receives the impulse of a pinion -9- which when it rotates on the axis -8- is moved by thrust of the latch -12- that is installed on the mobile holder -10- and which can be positioned according to whether it is desired to make the said pinion rotate in one direction or the other.

6. Machine to connect casings together by means of axial thrust, as per claim 1, which is characteristic because the piece -1- is prolonged according to the guide piece -2-, and on the latter a support clasp is set up and the piece -44- which it is wished to connect is held and the semicylindrical housing -30- is formed and prolonged towards one side by means of two ears -31- between which the axis -32- is placed which serves to shift the other half of the clasp sideways.

7. Machine to connect casings together by means of axial thrust, as per claims 1 to 6, which is characteristic because the part -6- that comprises the other half of the clasp, which is also semi-cylindrical, has a wide ear -33- on one side which is on the axis -32- and because of this can be shifted sideways once it has been lowered onto -5-, and on the opposite side to the ear -33- it has a peg -35- which, when the aforesaid lowering is done, is opposite to the groove -43- of the piece -37- and after the lateral shifting, the said peg is lodged in the aforesaid groove -43-.

8. Machine to connect casings together by means of axial thrust, as per claims 1, 6 and 7, which is characteristic because the piece -37- that has the groove -43- where the peg -35- has been lodged can be shifted along guides -36- which are linked to the general body of the machine -1-.

9. Machine to connect casings together by means of axial thrust, as per claims 1, 6, 7 and 8, which is characteristic because the piece -37- also has a window -45- where a cam -39- is lodged, which is part of a lever -42- which by rotating and by the action of the aforesaid cam, makes the piece -37- go down, and consequently the peg -35- and finally joins the pieces -6- and -5- which comprise the holder, firmly.

10. Machine to connect casings together by means of axial thrust, as per claim 1, which is characteristic because the main body -1- is prolonged in a robust crosswise sheet -3- where the part -26- is housed in the forked part, which has its periphery grooved as per -27- and which after it is positioned remains stable thanks to the thicknesses -4- that the sheet -3- has in one of its sides.

11. Machine to connect casings together by means of axial thrust, as per claims 1 and 10, which is characteristic because the aforesaid crosswise sheet -3- that is opposite to -15- has a spring -17- on the same side as the stops -4- which has one of its ends held in a stub -16- and the other in a side groove of the said sheet -3-, and this said elastic retension spring serves the piece -26- when it has been introduced into the forked housing of the piece -3-.

FIG.1

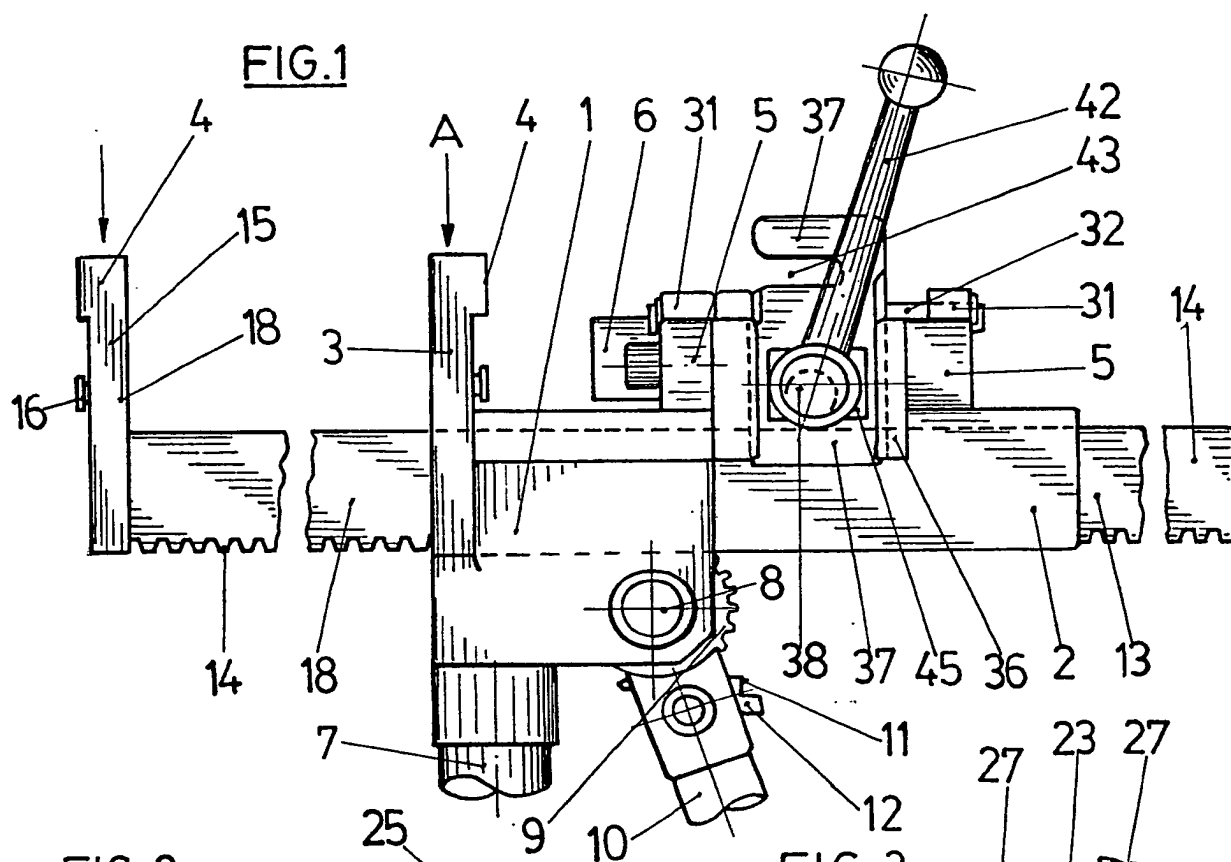


FIG.2

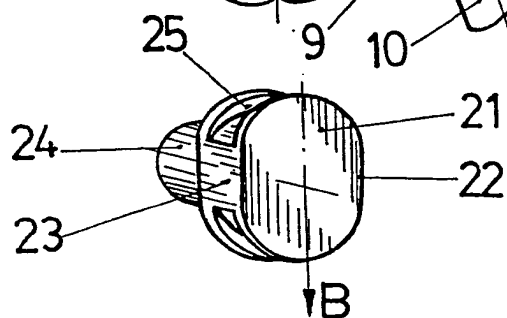


FIG. 3

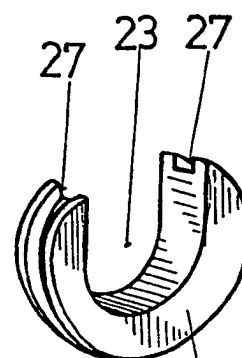


FIG. 4

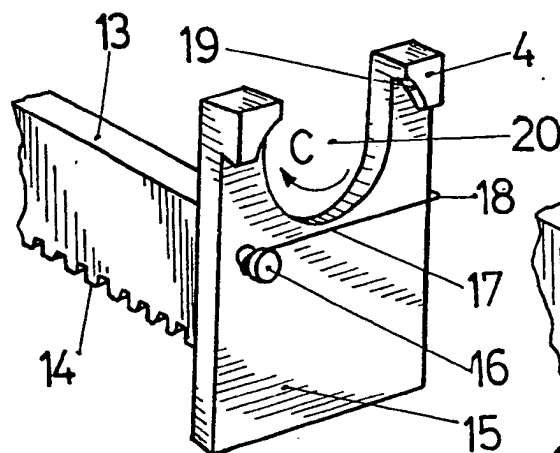


FIG. 5

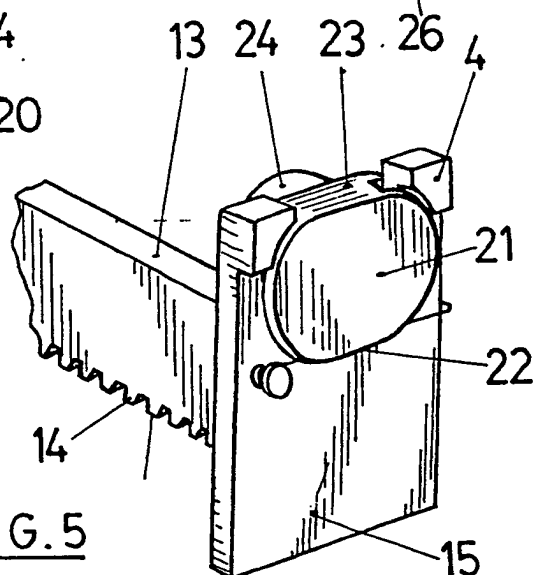


FIG.6

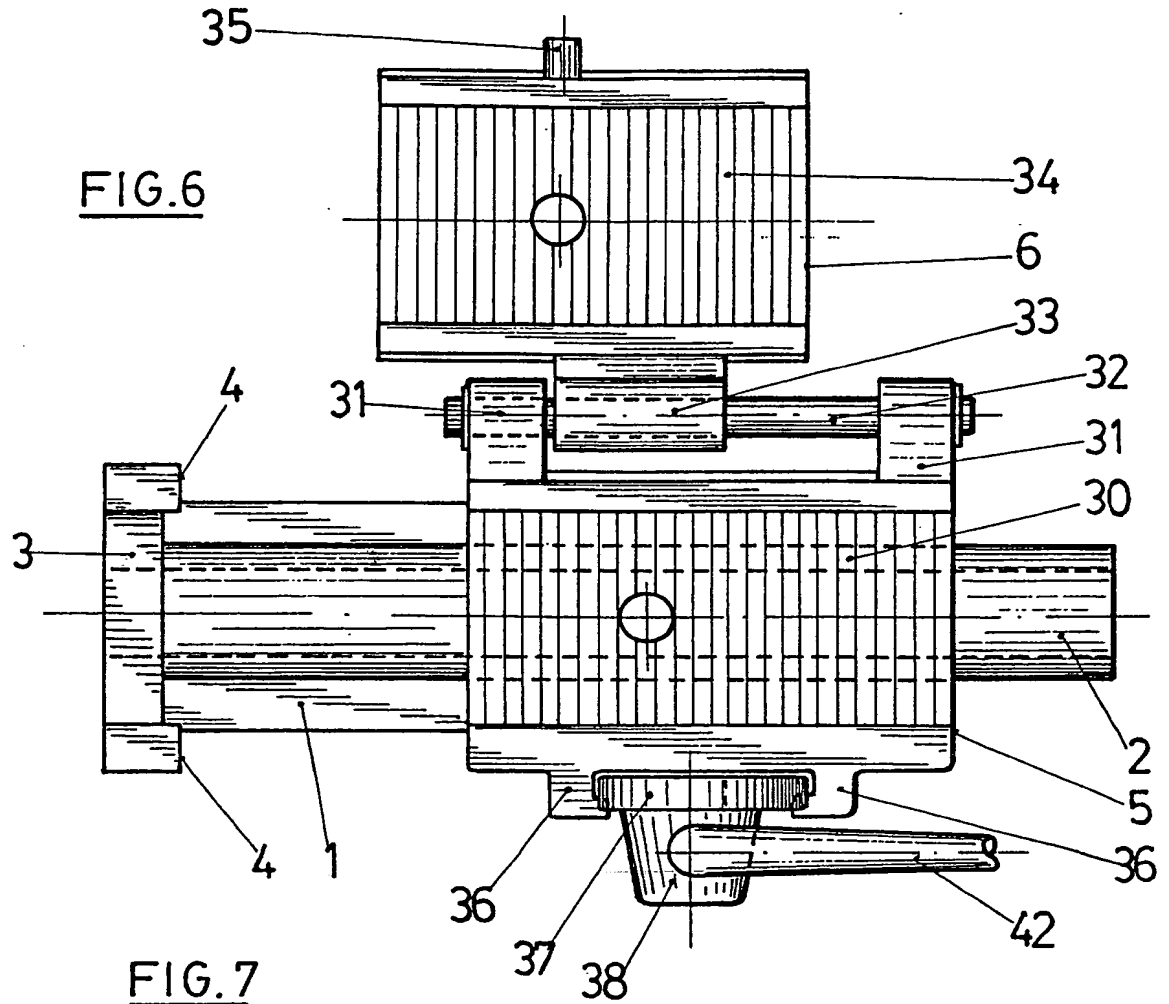
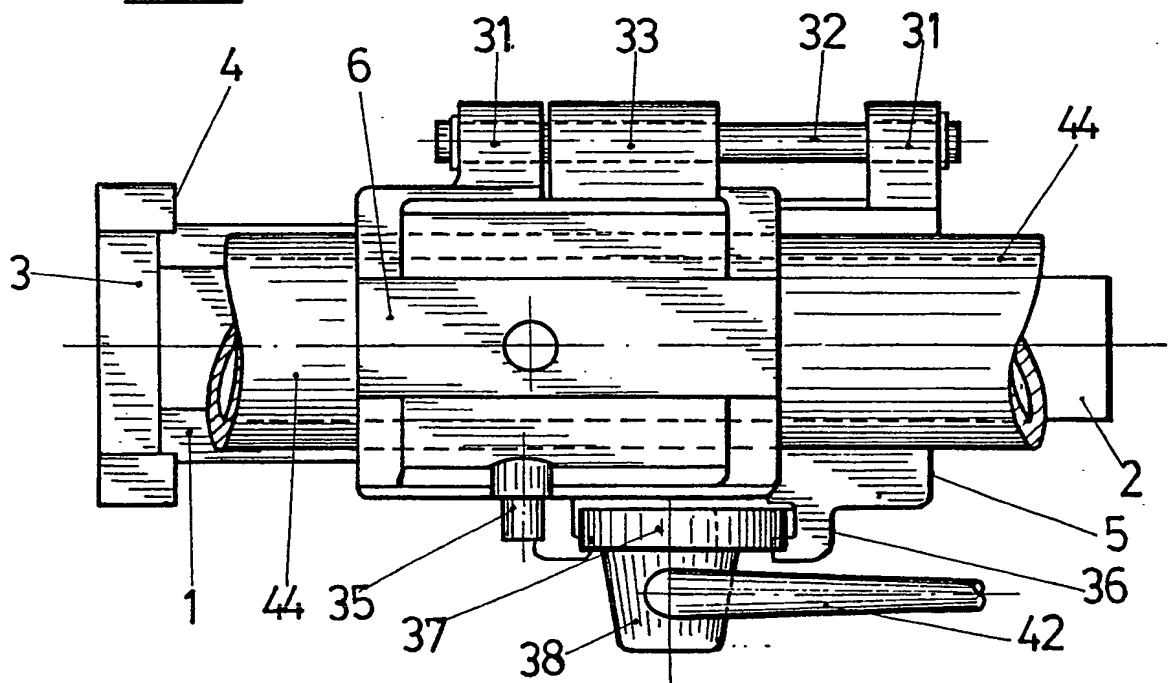


FIG.7



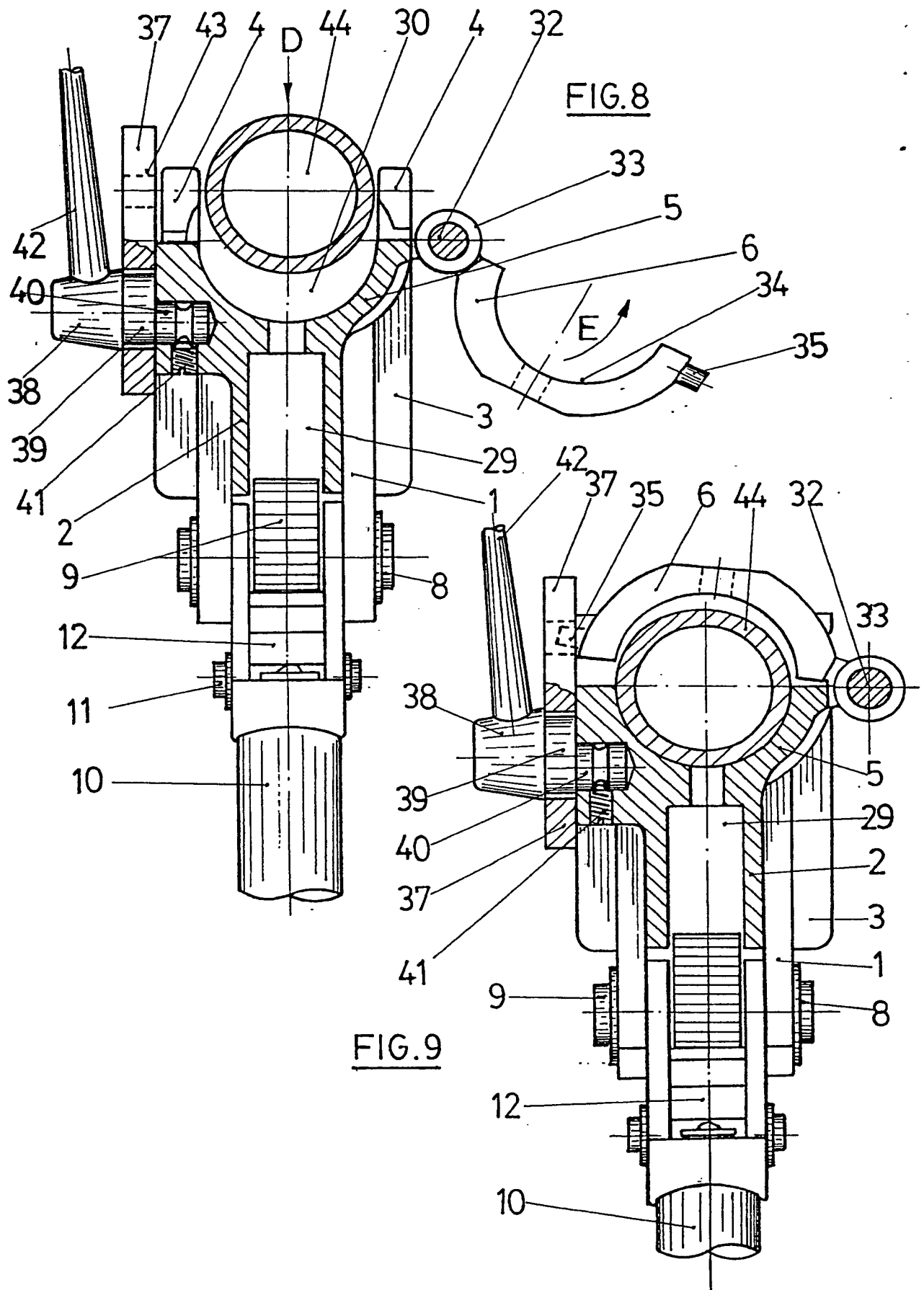




FIG. 10

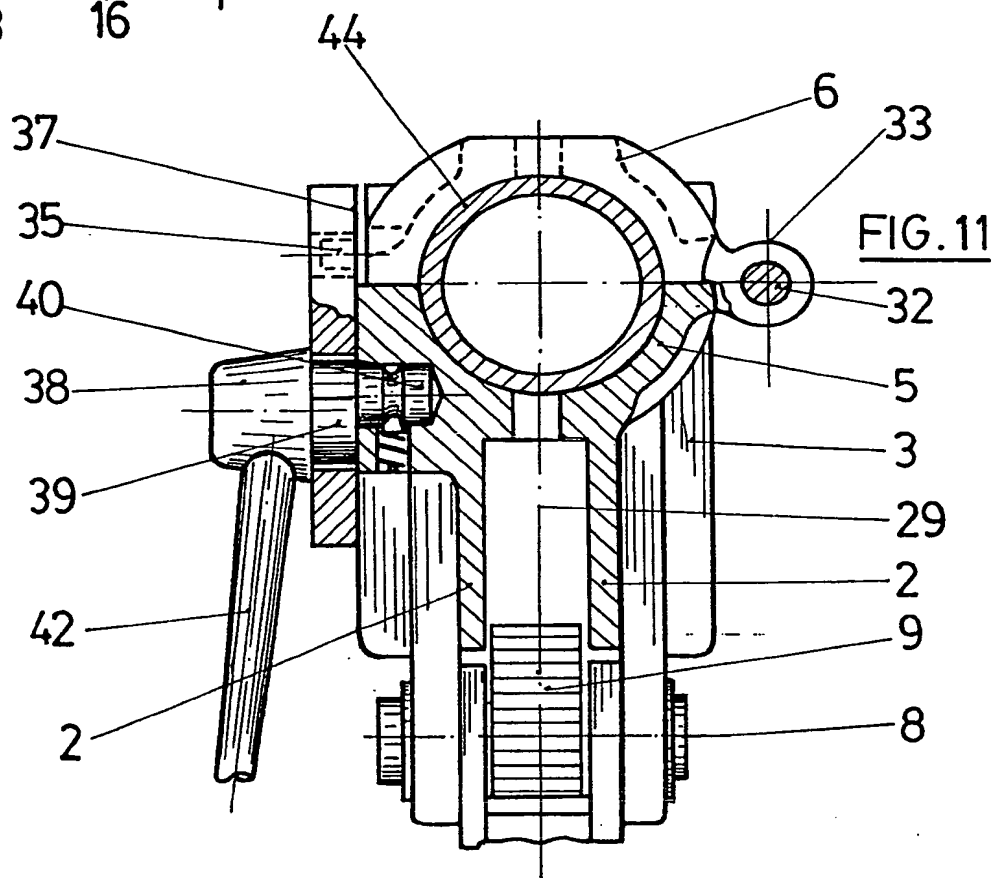
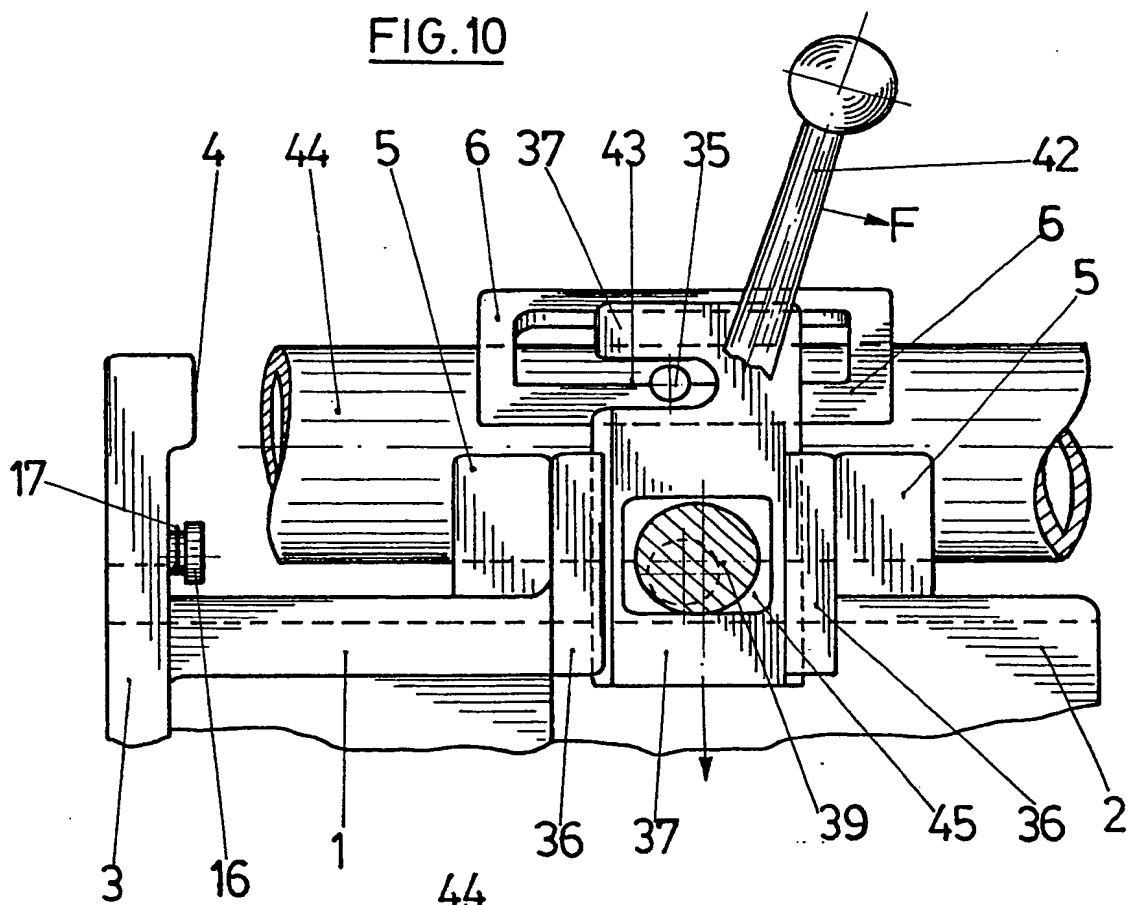


FIG. 11



DOCUMENTS CONSIDERED TO BE RELEVANT			EP 89500001.6
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
A	<u>GB - A - 2 167 697</u> (MEI LIH LI) * Claims 1,2; fig. * ---	1,5	B 23 P 19/00 B 25 B 5/02
A	<u>GB - A - 2 163 080</u> (R. H. MORGAN LIMITED) * Claims 1,2; fig. 2 * ---	1,5	
A	<u>DE - C - 704 796</u> (HEINKEL) * Patentanspruch; fig. 1,2 * ---	1,6,7, 8	
A	<u>DE - A1 - 3 118 329</u> (MAQUINARIA GEKA S. L.) * Zusammenfassung; fig. 4 * -----	2,3	
			TECHNICAL FIELDS SEARCHED (Int. Cl.4)
			B 23 P 19/00 B 23 P 21/00 B 25 B 1/00 B 25 B 5/00 B 25 B 13/00 B 25 B 27/00 B 21 D 28/00
The present search report has been drawn up for all claims			
Place of search VIENNA		Date of completion of the search 27-06-1989	Examiner BISTRICH
<b>CATEGORY OF CITED DOCUMENTS</b>			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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